National Institute for Health and care Excellence

Public health guideline

Scope

1 Guideline title

Antimicrobial resistance: changing risk-related behaviours in the general population

1.1 Short title

Antimicrobial resistance

2 Background

a) The National Institute for Health and Care Excellence (NICE) has been asked by the Department of Health to develop a public health guideline aimed at delaying antimicrobial resistance. This will focus on public education about:

- the importance of using antimicrobials correctly
- the dangers associated with their overuse and misuse
- changes in behaviour that can avert the problems associated with the misuse of antimicrobials, such as infection prevention and control measures.

b) The World Health Organization defines antimicrobial resistance as 'resistance of a microorganism to an antimicrobial drug that was originally effective for treatment of infections caused by it' (Antimicrobial resistance fact sheet). Resistant microorganisms (including bacteria, fungi, viruses and parasites) are able to withstand attack by antimicrobials (for example, antibiotics, antifungals, antivirals and antimalarials). As a result, standard treatments become ineffective and infections persist, increasing the risk of them spreading. Resistance is a natural evolutionary

phenomenon but the use (and misuse) of antimicrobials accelerates this process. Poor infection prevention and control practices, inadequate sanitary conditions and inappropriate food-handling encourage the further spread of antimicrobial resistance.

c) The Department of Health's Annual report of the Chief Medical Officer 2011: volume two highlights the seriousness of antimicrobial resistance to global health. It also highlights the policies and political action that are needed. This includes awareness-raising among the public, healthcare managers and professionals about antimicrobial resistance and the correct use of antimicrobials.

d) The Department's UK 5 Year antimicrobial resistance strategy 2013 to 2018 has 3 aims:

- to improve the knowledge and understanding of antimicrobial resistance
- to conserve and steward the effectiveness of existing treatments
- to stimulate the development of new antibiotics, diagnostics and novel therapies.

e) This guideline will support a number of related policy documents including:

- Action plan against the rising threats from antimicrobial resistance (European Commission 2011)
- Annual report of the Chief Medical Officer 2011: volume two (Department of Health 2013)
- Antimicrobial prescribing and stewardship competencies (Department of Health 2013)
- European strategic action plan on antibiotic resistance (World Health Organization 2011)
- UK 5 year antimicrobial resistance strategy 2013 to 2018 (Department of Health 2013)

- WHO global strategy for containment of antimicrobial resistance (World Health Organization 2001).

f) This guideline will provide recommendations for good practice at local and regional level, based on the best available evidence of effectiveness, including cost effectiveness. It is aimed at: commissioners, managers, professionals and professional bodies with responsibility for prescribing and dispensing antimicrobials or with public health as part of their remit. They will work within the NHS, social services, local authorities and the wider public, private, voluntary and community sectors. In addition, it may be of interest to people who are particularly vulnerable to infection (such as people with suppressed immune systems due to cancer treatment) and other members of the public.

g) The guideline will complement NICE's guideline on 'Antimicrobial stewardship'. For further details, see section 5.

This guideline will be developed using the NICE guideline development process and methods.

3 The need for guidance

a) Infectious diseases are the largest cause of death and disease globally. But in England, largely due to vaccination programmes and antimicrobials, death from infectious diseases is relatively low. For example, in 2010 they accounted for 7% of deaths. However, they are still a major cause of death in the very young, very old and people with a chronic disease (such as chronic bronchitis or cancer) and a major cause of illness in the UK. People from lower socioeconomic and marginalised groups experience higher rates of infectious disease and poorer outcomes. (Marginalised groups include: people who are homeless, who misuse drugs, who have been in prison or are from some migrant communities.) For

example, these groups are more likely to have tuberculosis, transmit it to others and to have a drug-resistant strain (Annual report of the Chief Medical Officer 2011: volume two Department of Health).

b) In England, infectious diseases accounted for around 3.4 million (8%) of hospital bed days in 2010/11 ('Annual report of the Chief Medical Officer 2011: volume one'). In addition, in 2013 in the UK, 21% of all days lost at work (approximately 27 million days) were due to infectious diseases such as coughs, colds and flu (Sickness absence in the labour market, February 2014 Office for National Statistics).

c) The World Health Organisation estimates that antimicrobials add, on average, 20 years to life expectancy[1] (Self-prescription of antibiotics boosts superbugs epidemic in the European Region Davies 2013). But microbial resistance is increasing and there is a lack of new antimicrobials to treat resistant diseases. It is vital to ensure the antimicrobials that are still effective remain so for as long as possible, to allow time for the research and development of new ones. Effectiveness is most likely to be conserved by:

- correct and timely diagnosis
- taking the correct dose for the correct amount of time and via the correct route
- not keeping antimicrobials for use another time
- not self-medicating (taking an antimicrobial without prescription or advice from a healthcare professional)
- not sharing antimicrobials with others
- not using counterfeit medicines (Davies 2013).

Preventing infection and minimising the spread of any infections is also vital.

[1] Broader environmental factors, such as improvements in nutrition, hygiene and sanitation and overcrowded housing also helped prevent and reduce the transmission of infectious diseases (Davies 2013).

d) Viruses (such as HIV), parasites (such as malaria) and fungi (for example, *candida*) are showing resistance to antivirals, antiparasitics and antifungals respectively. But antibiotic resistance is the main concern. Common bacteria such as *Escherichia coli*, *Klebsiella pneumoniae* and *Staphylococcus aureus* have high rates of resistance. These bacteria cause many common infections, for example, urinary tract, wound and bloodstream infections and pneumonia (Antimicrobial resistance: global report on surveillance 2014 WHO). In the UK, the spread of multidrug-resistant tuberculosis and gonorrhoea is also a worry ('Annual report of the Chief Medical Officer 2011: volume one').

e) National campaigns to raise public and professional awareness of antibiotic resistance may reduce antibiotic prescribing and demand (European antibiotic awareness day 2013 evaluation report Department of Health). But a 2013 survey of 2033 people in the UK by Ipsos MORI (Antibiotics: a cure for the common cold?) revealed that:

- 16% wrongly believe antibiotics work on coughs and colds
- around 40% think antibiotics can kill viruses
- around 7% do not complete a course of antibiotics.

There is also evidence that most people requesting antibiotics to treat a cough are given them by a healthcare professional (Coenen et al. 2006).

f) A range of behaviours can help reduce the transmission of infections. These include hand washing, use of tissues when coughing and sneezing, good food hygiene and generally keeping the home clean. But many people do not adopt these behaviours. For example, according to a recent US study of 3749 people using 'rest rooms' in a college town: only 1 in 20 washed their hands long enough to remove infectious bugs (15 to 20 seconds); 1 in 10 did

not wash their hands; and a third did not use soap (Borchgrevink et al. 2013).

g) Infections and infectious diseases in England cost the NHS an estimated £30 billion per year. Many of these costs are due to respiratory or gastrointestinal infections (Annual report of the Chief Medical Officer 2011: volume two Department of Health). The economic costs of antimicrobial resistance are largely unknown ('Antimicrobial resistance: global report on surveillance'). However, the World Health Organization has concluded that: 'the burden of morbidity and mortality resulting from antibiotic resistance in many infections and settings has serious consequences for individuals and society in terms of clinical outcomes and added costs'.

4 The guideline

This document defines exactly what this guideline will (and will not) examine, and what the guideline developers will consider. The scope is based on a referral from the Department of Health (see appendix A).

4.1 Who is the focus?

4.1.1 Groups that will be covered

People of all ages, including children and young people, living at home, in the community or who are in hospital. There will be a particular focus on people who regularly take a lot of antibiotics, such as young children and older people and people who misuse antibiotics.

Where appropriate, there will also be a focus on people whose social and economic circumstances or health puts them at greater risk of acquiring or transmitting infectious diseases and antimicrobial resistant strains. This includes:

- people who are immunosuppressed (for example, due to cancer treatment or an organ transplant)
- people who have a chronic disease

- people who live in crowded conditions (see Shelter's definition for further details)
- people who are homeless
- people who have been in prison
- people who have migrated from countries with a high prevalence of infectious diseases such as tuberculosis (examples include South Asia and sub-Saharan Africa).

4.1.2 Groups that will not be covered

None.

4.2 Activities

4.2.1 Activities and measures that will be covered

a) Interventions to reduce the misuse of antimicrobials, particularly antibiotics. This includes educating the general public about:

- When, why and how to use antimicrobials.
- The dangers of overuse and misuse. (This includes self-medication – taking an antimicrobial without prescription or advice from a healthcare professional, sharing antimicrobials, not completing or missing doses, buying antimicrobials on the Internet or using counterfeit antimicrobials.)
- Suitable alternatives to antimicrobials. (For example, using over-the-counter medicines for the symptoms of a cold.)

b) Interventions that are delivered at the population, community, organisational or individual level in any setting and by any mode of delivery (for example via the Internet, apps, face-to-face). Examples include:

- Population and community level: media campaigns on antibiotic use and infection prevention (hand washing, food hygiene).

- Individual level: prescribers and dispensers telling patients how important it is to use antimicrobials properly and the dangers of over- and misuse.

c) Education for the general public about the type of healthcare they should ask for to prevent or treat infectious diseases. For example, so people are clear that:

- antibiotics should not be used for a cold or flu
- vaccines or other protection, such as anti-malarial medication, should be used when travelling abroad.

d) Education for the general public about how to reduce the spread of antimicrobial resistance at home and in the community. This includes hand-washing, using a tissue to cover the mouth when coughing and sneezing and food hygiene to prevent and reduce transmission of infection.

e) For the economic analysis, we expect to adopt a mainly public sector perspective, although an attempt will be made to use a societal perspective. (This may prove too difficult to achieve with any accuracy.) Separate perspectives will be presented for local government and the NHS. We expect that quality-adjusted life years gained will be the main measure of health benefit.

The Committee will take reasonable steps to identify ineffective measures and approaches.

4.2.2 Activities and measures that will not be covered

a) National and international policy on antimicrobial resistance.

b) Surveillance to track antimicrobial use and resistance in bacteria.

c) Development of new antimicrobials, treatments and diagnostics.

d) Education of prescribers about the diagnosis of infectious diseases and clinical decisions concerning whether to prescribe an antimicrobial.

e) Education of healthcare professionals about hygiene practices to prevent the spread of infectious diseases.

f) Environmental cleanliness and cleaning products.

g) Treatment of healthcare-associated infections.

h) Promotion of safe sex.

i) Antimicrobial use in animals.

4.3 Key questions and outcomes

Below are the overarching questions that will be addressed along with some of the outcomes that would be considered as evidence of effectiveness.

Question 1: Which educational interventions are effective and cost effective in changing the public's behaviour to ensure they only ask for antimicrobials when appropriate and use them correctly?

Expected outcomes

Changes in:

- knowledge and awareness of when, why and how antimicrobials should be used
- knowledge and awareness of antimicrobial resistance
- knowledge of the type of support people can expect from health professionals in relation to the use of antimicrobials
- the ability and confidence of prescribers and dispensers to talk to people about the use and misuse of antimicrobials
- demand for antimicrobials (particularly antibiotics)
- adherence to prescribed antimicrobials
- inappropriate antimicrobial use
- inappropriate antimicrobial prescribing by healthcare professionals.

Question 2: Which educational interventions are effective and cost effective in changing the public's behaviour to prevent infection and reduce the spread of antimicrobial resistance?

Expected outcomes

Changes in:

- people's knowledge and awareness of how they can prevent infection and reduce the spread of antimicrobial resistant microbes
- hand-washing behaviour
- behaviour to reduce the spread of airborne diseases such as TB and flu (for example, use and appropriate disposal of tissues when coughing and sneezing)
- food hygiene practices.

4.4 Status of this document

This is the final scope, incorporating comments from a 4-week consultation between 7 August and 5 September 2014. Following consultation, the final version of the scope will be available on the NICE website from October 2014.

5 Related NICE guidance

Published

- Behaviour change: individual approaches (2014) NICE guideline PH49
- Infection: prevention and control of healthcare-associated infections in primary and community care (2012) NICE guideline CG139
- Patient experience in adult NHS services (2012) NICE guideline CG138
- Prevention and control of healthcare-associated infections: quality improvement guide (2011) NICE guideline PH36
- Reducing differences in the uptake of immunisations (2009) NICE guideline PH21
- Medicines adherence (2009) NICE guideline CG76
- Respiratory tract infections: antibiotic prescribing (2008) NICE guideline CG69

- Behaviour change: the principles for effective interventions (2007) NICE guideline PH6

Under development

- Pneumonia NICE guideline (publication expected December 2014)
- Medicines optimisation NICE guideline (publication expected March 2015)
- Antimicrobial stewardship NICE guideline (publication expected May 2015)

Appendix A Referral from the Department of Health

The Department of Health asked NICE to develop:

‘Public health guidance for healthcare professionals, health and social [care] providers, local authorities, commissioners and the general public on public education about the importance of the appropriate use of antimicrobials, the dangers associated with the overuse and misuse of antimicrobials, cost effective interventions and the steps that can be taken to avert threats associated with the misuse of these drugs including basic personal infection control and drive behaviour change.’

Appendix B Potential considerations

It is anticipated that the Public Health Advisory Committee (PHAC) will consider the following issues:

- The target audience, actions taken and by whom, context, frequency and duration.
- Whether interventions are based on an underlying theory or conceptual model.
- Whether interventions are effective and cost effective.
- Whether effectiveness and cost effectiveness varies according to:
  - type of behaviour targeted
  - diversity of the population (for example, in terms of the user's age, socioeconomic status, disability, sexual orientation, gender or ethnicity)
  - status and characteristics of the person delivering the intervention and the way it is delivered
  - intervention frequency, length, duration and intensity
  - where the intervention takes place
  - whether the intervention is transferable to other settings.
- Whether interventions lead to a widening in health inequalities and any trade-offs between equity and efficiency.
- Any factors that prevent – or support – effective implementation.
- Any adverse or unintended effects. In particular, a reduction in the prescribing or use of antimicrobials when they are really needed.
- Current practice.
- Skills base required to deliver antimicrobial resistance and infection prevention interventions.
- Availability and accessibility for different groups (such as people who are homeless, who are migrants or who have a history of being in prison).

Appendix C References

Borchgrevink CP, Cha J, Kim S (2013) Hand washing practices in a college town environment. Journal of Environmental Health 75(8): 18–24

Coenen S, Michiels B, Renard D et al. (2006) Antibiotic prescribing for acute cough: the effect of perceived patient demand. British Journal of General Practice 56: 183–90

Davies SC (2013) The drugs don’t work. A global threat. London: Penguin